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ABSTRACT

To satisfy federal requirements, the National Center for Education Statistics and the Division of Adult Education and Literacy planned a nationally representative household sample survey to assess the literacy skills of the adult population of the United States, to be conducted by the Educational Testing Service with the assistance of Westat, Inc. This report describes the development of the National Adult Literacy Survey framework, the development of the background questionnaire, the development of simulation tasks, state adult literacy surveys, and participants in the development process. Results from the survey will provide policymakers and others with information on the condition of literacy in the United States. The field test was conducted in 1991, and the main data collection took place in 1992 with a sample of 14,900 adults aged 16 years and older living in the 50 states and the District of Columbia. Black and Hispanic households were oversampled to ensure reliable estimates of their literacy proficiencies. Results will describe the literacy skills demonstrated by the total adult population as well as by adults comprising various sub-groups and will characterize these skills in terms of demographic and personal background information. Seven tables present information about the samples. An appendix of sample tasks contains some of the prose, document, and quantitative tasks adults were asked to complete. (SLD)

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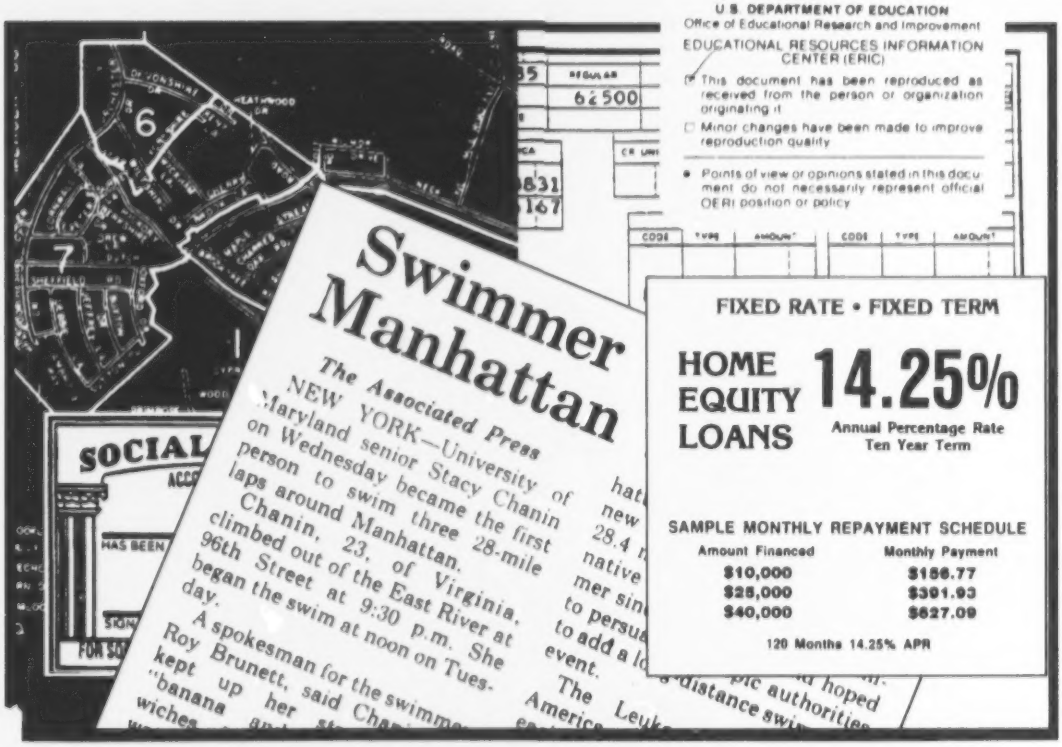
ASSESSING LITERACY

The Framework for the National Adult Literacy Survey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ASSESSING LITERACY

The Framework for the National Adult Literacy Survey

by
Anne Campbell
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U.S. Department of Education
Lamar Alexander, Secretary

Office of Educational Research and Improvement
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National Center for Education Statistics
Emerson J. Elliott, Commissioner

National Center for Education Statistics
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Chapter 1

Introduction

Historically, as a nation, we have placed a high premium on literacy skills as they affect both individual well-being and society at large. During the last century, literacy has taken on even greater importance as we have moved from predominantly an agrarian to an industrial society. It was during this transition that our nation came to require that increasing numbers of people have a basic set of literacy skills and knowledge in order to meet changing societal needs. In addition, the types and levels of literacy skills needed for citizenship and individual economic advancement have changed over time and will continue to change as we advance into the twenty-first century. In our technologically advancing society, both the quantity and types of written materials are growing, and increasing numbers of citizens are expected to use information from these materials in new and more complex ways.

Within this context, our nation's literacy skills have increased dramatically in response to new literacy requirements and expanded opportunities for social and economic growth. Today, we are a better educated and more literate society than at any time in our history; however, we find ourselves in a period of imbalance when the literacy demands seem to surpass the levels of skill. While in the past we relied primarily on our formal education system to correct any such imbalance, we now recognize that a school-centered strategy can be only part of the solution.

Rapid technological, economic, and labor market changes demand that we pay increasing attention to the skills of those already in the work force. It is estimated that almost 80 percent of the projected work force for the year 2000 is already employed. As a result, developing new and more effective strategies for increasing the literacy skills of both the current and future work force is essential if our nation is to maintain its standard of living and compete successfully in the global market. Improved literacy skills are equally as important for participation in our technological society with its formal institutions, complex legal system, and large government programs.

At the historic education summit in Charlottesville, Virginia, President Bush and the nation's governors met to establish a set of National Education Goals that would guide the country into the twenty-first century. As adopted and reported by members of the National Governors' Association in 1990, one of the six goals states:

By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Since the goals were adopted, Congress passed the National Literacy Act of 1991. The purpose of this Act is "to enhance the literacy and basic skills of adults, to ensure that all adults in the United States acquire the basic skills necessary to function effectively and achieve the greatest possible opportunity in their work and in their lives, and to strengthen and coordinate adult literacy programs."

Few, if any, deny the important role literacy plays in our society or the advantages afforded those who have acquired and demonstrated high levels of proficiency; however, identifying and measuring just what skills people have and need to function adequately have proven to be difficult tasks. Although a number of reports have served to focus attention on literacy, we do not know with any precision what types and levels of literacy skills adults living in the United States possess or how these skills are distributed across major subgroups of interest. It is this lack of precise and definitive information that the National Adult Literacy Survey (NALS) seeks to address by gathering both background and cognitive data relating to the literacy skills of the nation's adults. The information that will be available from the survey is critical to policymakers responsible for targeting resources and designing and implementing appropriate actions with respect to literacy.

This publication serves as an interim report of the National Adult Literacy Survey and, as such, does not contain any results. The purpose of this report is to set forth the definition of literacy and the framework that guided the development of the instruments for the NALS. This chapter provides an overview of the survey's purpose, conduct, and survey samples. Chapter 2 discusses the framework of the survey, including the issues involved in measuring literacy, the definition of literacy, and literacy scales that were adopted. In chapter 3, the scope of the background questionnaires is presented, including the issues that are addressed by the questions. The framework and process for developing the literacy simulation tasks are presented in chapter 4. Finally, chapter 5 discusses the state adult literacy survey option.

Overview of the National Adult Literacy Survey

The Adult Education Amendments of 1988 require the U.S. Department of Education to submit a report to Congress on the definition of literacy and then to report on the nature and extent of literacy among adults in the nation. To satisfy these requirements, the National Center for Education Statistics (NCES) and the Division of Adult Education and Literacy planned a nationally representative household sample survey to assess the literacy skills of the adult population of the United States. In September 1989, NCES awarded a four-year contract for that purpose to Educational Testing Service (ETS) with a subcontract to Westat, Inc. for sampling and field operations.

Results from the National Adult Literacy Survey will provide policymakers, business and labor leaders, educators, researchers, and

citizens with vital information on the condition of literacy in the United States that is not currently available from the frequently administered school-based surveys. Information from the survey will:

- describe the levels of literacy demonstrated by the total adult population as well as by adults comprising various subgroups, including those targeted as "at risk"
- characterize the demonstrated literacy skills in terms of demographic and personal background information
- characterize the work force of the country with respect to demonstrated literacy skills and activities reported by individuals in various occupational categories
- compare assessment results with those from the young adult literacy assessment conducted by ETS in 1985 under a grant from the U.S. Department of Education and the workplace literacy survey conducted by ETS under contract to the U.S. Department of Labor
- interpret the findings related to information-processing skills and strategies in a way that can inform curriculum decisions pertaining to the education and training of adults
- provide an increased understanding of the skills and knowledge associated with functioning in a technological society

The field test for the survey was conducted in the winter and spring of 1991, and the main data collection took place in the winter and spring of 1992. Both the field test and the main survey were administered in one-on-one interviews by trained interviewers who are experienced in interviewing techniques and testing methodologies. Each interview lasted approximately one hour and consisted of about 15 minutes of background questions and 45 minutes of literacy simulation tasks. The results will be released in 1993 and will be presented in several reports tailored to the information needs of various audiences.

Survey Samples

The survey was conducted with a representative sample of 14,900 adults aged 16 and older living in households in the 50 states and the District of Columbia. Black and Hispanic households were oversampled to ensure reliable estimates of their literacy proficiencies. In order to enable comparisons with the young adult literacy results, the sample included a sufficient number of adults aged 21 through 25 years. No special design modifications were necessary because the number of 21- to 25-year olds in the sample was expected to be within the range of the 1,350 to 1,850 young adults needed to provide estimates for comparisons. Finally of the total sample, 2,700 adults were aged 65 and older.

Inmates of federal and state prisons were also included in the survey. A supplementary sample of 1,000 male and female inmates over the age of 16 were surveyed in order to provide separate estimates of literacy levels for the incarcerated population. In addition, it will be possible to reduce the impact of non-coverage on estimates of literacy rates for Black males by

incorporating the incarcerated sample into the national sample. The expected sample of inmates was drawn from about 80 state and federal prisons from across the country, with an average of 12 to 15 inmates per facility participating. In total, approximately 15,900 adults were interviewed in households and prisons across the country (see Table 1.1).

Table 1.1 Expected Sample Size for the National Adult Literacy Survey

Category	Estimated Sample Size
Age 16 to 64	12,200
Age 65 and older	2,700
Incarcerated Persons	1,000
Total	**15,900**

Summary

The National Adult Literacy Survey was planned and implemented in response to the Adult Education Amendments of 1988, which call for a report on the status of literacy among the nation's adults. To this end, adults aged 16 and older from across the country were interviewed in 1992 in order to collect background information and cognitive data on the literacy skills of the nation's population. The results will describe the literacy skills demonstrated by the total adult population as well as by adults comprising various sub-groups and will characterize those skills in terms of demographic and personal background information.

Chapter 2

Framework Development

The purpose of the National Adult Literacy Survey (NALS) is to report on the nature and extent of the literacy skills demonstrated by the adult population residing in households in the United States. To meet this goal, the NALS builds on recent research relating to the nature of literacy in our society as well as on methodological and technological advancements in the areas of assessment and psychometrics. Thus, it is useful to review the historical context for the investigation of literacy to show how the NALS builds on earlier work and evolving conceptions of literacy.

Issues Involved in Measuring Literacy

To gauge early literacy rates, historians have had to rely upon such indicators as counts of signatures taken from legal documents, such as wills, marriage licenses, and deeds. A deliberate effort to study literacy rates began in the mid-1800s when the Census Bureau started gathering information on self-reported literacy rates. The Bureau counted as illiterate those who reported that they could not read or write a simple message in English or any other language.

By around 1920, however, two factors set the stage for a shift away from reliance on self-reported statistics toward standardized measures of reading/literacy based on demonstrated performance. First, the widespread failure of Army recruits on entrance tests during World War I suggested that the self-reports about literacy such as those collected by the Census Bureau were not reliable. Second, there was a growing interest in the potential of standardized testing for educational purposes. Educational testing was promoted as a means for diagnosing specific learner strengths and deficiencies, for describing particular learner achievements, and for measuring program outcomes.[1] These factors combined to focus attention on what will be discussed as the "traditional approach" to assessing literacy.

The Traditional Approach. Through the use of standardized objective tests of reading achievement, it was possible to estimate percentages of various population groups performing at or above specified reading grade levels. This led to attempts to establish a criterion for literacy based on grade-level scores on reading tests. Persons scoring at or above a specified level were considered to have adequate reading skills to perform successfully on materials or tasks judged to be of comparable grade-level difficulty. Those persons who failed to attain the specified level were labeled as "illiterate" or "functionally illiterate" and

[1] Oscar K. Buros, "Fifty Years in Testing: Some Reminiscences, Criticisms, and Suggestions," *Educational Researcher* (July-August 1977): 9-15.

were presumed to lack the necessary reading skills to function in our society.[2]

The use of grade-level test scores as an indicator of literacy problems among adults has some serious limitations. Grade-level scores are typically determined from the average performance of an in-school norming sample on multiple-choice questions covering a particular set of school-related reading passages. In contrast, the literacy materials that adults generally encounter in various everyday contexts are different from the materials typically associated with school-based standardized tests. As a result, performance on these school-based tests is often not a good predictor of performance on literacy tasks associated with non-school settings.[3]

An additional consideration is that questions are typically selected for inclusion in a standardized test on the basis of item statistics designed to yield scores that maximally differentiate among individuals. Such a procedure can result in reliable and valid tests for purposes of ranking and selection, but, particularly with adults, it is less useful for purposes of instructional placement, diagnosis of specific strengths and weaknesses, or for the certification of specific competencies. This limitation in part reflects the fact that analyses are rarely, if ever, undertaken to determine specific factors contributing to task difficulty. Despite this fact, the purposes identified above are the very ones for which standardized reading achievement tests have been employed in literacy programs for adults. Concerns such as these led researchers in the 1970s to move to what is called here the "competency-based approach" to the assessment of adult literacy.

The Competency-Based Approach. During the 1970s, national performance surveys, such as those conducted by Louis Harris and Associates, Educational Testing Service, and the National Assessment of Educational Progress, attempted to go beyond school-related reading tasks by including a range of materials more like those that adults typically encounter at home, at work, or in their communities.[4] The most publicized of these national surveys was the Adult Performance Level (APL) project. In addition to reading and writing skills, the APL project included measures of computation, problem solving, and interpersonal skills. The results were reported on performance measures as they interacted with content areas such as occupational knowledge, consumer economics, health, and law.[5]

[2] Irwin S. Kirsch, "Measuring Adult Literacy," in *Toward Defining Literacy*, edited by Richard L. Venezky, D. A. Wagner, and B. S. Ciliberti. Newark, NJ: International Reading Association, 1990.

[3] Irwin S. Kirsch and John T. Guthrie, "Prose Comprehension and Text Search as a Function of Reading Volume," *Reading Research Quarterly* (19, 1984): 331-342. Thomas Stitch, *Evaluation of the "Reading Potential" Concept for Marginally Literate Adults* (Final Report FR-ET50-82-2). Alexandria, VA: Human Resources Research Organization, January, 1982.

[4] Louis Harris and Associates, *Survival Literacy Study*. Washington, D.C.: The National Reading Council, 1970. Louis Harris and Associates, *The 1971 National Reading Difficulty Index: A Study of Functional Reading Ability in the United States, for the National Reading Center*. Washington, D.C.: The National Reading Center, 1971. Richard T. Murphy, *Adult Functional Reading Study* (Final Report, Project No. 09004, PR-73-48). Princeton, NJ: Educational Testing Service, 1973. National Assessment of Educational Progress, *Reading: Summary* (Report 02-R-00). Denver, CO: Education Commission of the States, 1972. National Assessment of Educational Progress, *Functional Literacy: Basic Reading Performance*. Denver, CO: Education Commission of the States, 1976.

[5] Norville Northcutt, *Adult Functional Competence: A Report to the Office of Educational Dissemination Review Panel*. Austin, TX: University of Texas, 1975.

While surveys such as those cited previously made significant advances over the traditional school-based measures of reading achievement, they also share some of the same limitations and assumptions. In these studies, no attempt was made to analyze the tasks with respect to the cognitive processes required for successful response or to determine what factors contributed to task difficulty. In addition, with the exception of the APL, these surveys employed the additive scoring model, summing across items to yield a single score. Thus, as with earlier standardized tests, these surveys treated literacy as an ability distributed along a single continuum. Because the single point selected to represent the standard of literacy varied from survey to survey, the estimates of "illiteracy" or "functional literacy" varied widely, ranging from about 13 percent to about 50 percent. While debate ensued as to the accuracy of the estimates of the extent of the literacy problem and the utility of a single benchmark or cut point, critics pointed to the varying definitions of literacy utilized, the different standards selected, and the differences among the tasks included as explanations for the noncomparability of results. An attempt to address these criticisms formed the basis for what is described next as the "profile approach."

The Profile Approach. In 1985, the National Assessment of Educational Progress (NAEP), under a grant to ETS, developed and conducted a household survey of the literacy skills of young adults, aged 21 to 25.[6] The purpose of this assessment was to examine the extent and nature of the literacy problem among young adults. Building on previous work in assessing literacy, the young adult assessment design attempted to extend the concept of literacy, to take into account the criticism of earlier surveys, and to benefit from advancements in educational assessment methods.

From its inception, the young adult literacy (YAL) assessment emphasized the importance of collecting background information as well as performance data in order to gain a better understanding of the condition of literacy among young adults. A background and attitude questionnaire was developed that collected information on family background, respondent characteristics, educational experiences, work and community experiences, and literacy practices. The data collected by the background questionnaire provided rich descriptive information of the young adult population and were useful in generating group comparisons and relational analyses. The tasks that yielded the performance data simulated the kinds of activities that adults normally engage in on a daily basis and that require a broad range of literacy skills for successful completion. The simulation nature of the tasks meant that they were open-ended in format.

Because a major goal of the YAL study was to estimate literacy

[6] Irwin S. Kirsch and Ann Jungeblut, *Literacy: Profiles of America's Young Adults*. Princeton, NJ: Educational Testing Service, 1986.

proficiencies for the young adult population and for certain subpopulations, there needed to be as broad a coverage of content as possible. In extending the range of content coverage, it was necessary to employ some form of item-sampling design because the entire set of tasks was too large to administer to any one person. This could have resulted in talking only about distributions of performance on individual items or about mean performance across tasks responded to by different samples of individuals. An alternative was to apply some form of scaling procedure in order to aggregate information across sets of tasks so that summary statements about group distributions could be made. The YAL study made use of item response theory (IRT),[7] a statistical method for scaling individual test items for difficulty in such a way that the item has a known probability for being correctly completed by an adult performing at a given proficiency level. This method quantifies the level of difficulty of each task along a scale as well as the performance of individuals along the same scale so that the likelihood of success on any item is a function of the item's characteristics and the person's proficiency.

Unlike previous studies, the YAL study provided measures along three scales that represented three distinct areas of literacy — prose, document, and quantitative — that became the three scales for reporting the results. The distinctiveness of the three scales was supported by factor analyses as well as conceptual analyses of the variables underlying performance.[8] These analyses suggested that both material and task characteristics varied somewhat among the three scales. Thus, using multiple literacy scales instead of one comprehensive scale better represented the multifaceted nature of literacy. Furthermore, the YAL study reported the proportions of the population that performed at various levels along each scale and portrayed the performance profiles of several population subgroups. The approach taken by the young adult study, therefore, viewed literacy not as a single dimension along which a single cut point or standard can be selected to separate the "literate" from the "illiterate," but rather as a set of complex information-processing skills that go beyond decoding and comprehending school-like prose materials.

Since the release of the results from the YAL survey, its profile approach to assessing literacy has been extended to three other literacy studies — the U.S. Department of Labor (DOL) Literacy Assessment[9] and the Mississippi[10] and Oregon[11] state assessments. The DOL assessment was designed to profile the literacy proficiencies of nationally representative samples of

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7 Ronald K. Hambleton, Hariharan Swaminathan, and H. Jane Rogers, *Fundamentals of Item Response Theory*. Newbury Park, CA: Sage, 1991.

8 Irwin S. Kirsch and Ann Jungeblut, *Literacy: Profiles of America's Young Adults*. Princeton, NJ: Educational Testing Service, 1986.

9 Irwin S. Kirsch and Ann Jungeblut, *Profiling the Literacy Proficiencies of JTPA and ES/UI Populations: Final Report to the Department of Labor*. Princeton, NJ: Educational Testing Service, September, 1992.

10 Arthur G. Cosby, et al, *The Mississippi Literacy Assessment: A Report to the Mississippi Employment Security Commission and the Governor's Office for Literacy, State of Mississippi*. Mississippi State: Mississippi State University, April, 1991.

11 Oregon Progress Board, *Oregon Benchmarks: Setting Measurable Standards for Progress*. Salem: Oregon Progress Board, January, 1991.

persons applying for the Job Training Partnership Act (JTPA) program and persons participating in either the Employment Service (ES) or Unemployment Insurance (UI) programs. This assessment used the literacy tasks administered in the YAL survey as well as new literacy tasks that were developed to complement the original tasks on each of the three literacy scales. Mississippi and Oregon each conducted their own state representative survey using the identical item pool to that of the DOL assessment.

Other literacy studies that looked at adult literacy from a multidimensional perspective have been conducted in two countries: the Survey of Literacy Skills Used in Daily Activities conducted in Canada in 1989,[12] and the Survey of Australian Adult Literacy.[13] The purpose of the Canadian study was to provide a direct assessment of the functional literacy skills of Canada's adult population, aged 16 to 64, in each official language. The results were reported on three scales: reading, numeracy, and writing. In contrast to the YAL survey, the Canadian study did not separate out reading prose from reading documents; the reading scale included items that were based on both documents and prose passages, with a heavy emphasis on documents. For the Canadian study, functional literacy was defined more in terms of the ability to process document-type materials rather than to read narrative or exposition. The Australian study sought to collect data regarding the state of adult literacy in order to inform debate about the educational programs that are necessary to meet the technological and economic developments in Australia. This study also reported results on three scales — prose, document, and quantitative — which were essentially modeled after the young adult literacy scales.

Defining Literacy

In developing the young adult literacy assessment, NAEP convened a panel of experts who, through a consensus process, helped to set the framework by adopting the following definition of literacy:

Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.

This definition characterizes literacy by focusing on what adults do with printed and written information. It rejects an arbitrary standard, such as signing one's name, completing five years of schooling, or scoring at the eighth grade level on a test of reading achievement. In addition, this definition goes beyond simply decoding and comprehending text and implies that the information-processing skills that adults use to think about content are part of the concept of literacy.

This definition provided the starting point for the deliberations of the NALS Literacy Definition Committee, which was appointed to advise ETS on the development and conduct of the

[12] Statistics Canada, *Adult Literacy in Canada: Results of a National Study*. Ottawa, Canada: Statistics Canada, September, 1991.

[13] Rosie Wickert, *No Single Measure: A Survey of Australian Adult Literacy*. Canberra, Australia: The Commonwealth Department of Employment, Education, and Training, 1989.

survey. In discussing the definition of literacy, the committee decided that expressing the literacy proficiencies in school-based terms is inappropriate and that higher-order thinking skills as well as the relevance and the context of the literacy tasks are important to literacy. In addition, committee members decided that while teamwork skills, interpersonal skills, and communication skills are important for functioning in various contexts, they are not part of literacy as defined and are beyond the scope of the NALS. They further endorsed the idea that literacy involves a multiple set of skills arrayed along a continuum, rather than discrete skills that are context bound and that literacy skills are employed across a variety of adult contexts that include work, home, and community. As a result of their discussions, the committee decided that to revise the definition of literacy would narrow rather than broaden the concept of literacy. The committee, therefore, unanimously adopted the definition of literacy used in the YAL assessment to guide the development and conduct of the NALS.

The adoption of the above definition of literacy for NALS has had an impact on the national discussion about literacy, including the National Literacy Act of 1991. As defined in the Act, literacy is "an individual's ability to read, write, and speak in English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one's goals and to develop one's knowledge and potential." It might be noted that this definition explicity recognizes the computational aspect of literacy and implies that there are multiple aspects of literacy.

Extending the Literacy Scales

The YAL assessment reported on the literacy skills of young adults in terms of three scales representing distinct and important aspects of literacy.

- Prose literacy: the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and fiction
- Document literacy: the knowledge and skills required to locate and use information contained in materials that include job applications, payroll forms, transportation schedules, maps, tables, and graphs
- Quantitative literacy: the knowledge and skills required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as to balance a checkbook, figure out a tip, complete an order form, or determine the amount of interest from a loan advertisement

This framework of three literacy scales became the basis of further discussions by the Literacy Definition Committee. They agreed that literacy should not be measured along a single continuum, but rather in terms of the three dimensions used in the YAL assessment. While the committee recognized that other scales, such as a writing scale, might be developed to capture other aspects of literacy, they realized that the resources available placed a constraint on the possibility

of their development. Furthermore, using printed and written information encompasses writing, and each of the three scales includes tasks that require the ability to write. As a result, the committee accepted the three existing literacy scales as the framework for the survey.

The committee further recommended that new literacy tasks be developed to enhance the three existing scales. They decided that the development of the new tasks should take into account the following:

- continued use of open-ended simulation tasks rather than multiple-choice questions
- continued emphasis on measuring a broad range of information-processing skills covering a variety of contexts
- increased emphasis on simulation tasks that require brief written and/or oral responses
- increased emphasis on tasks that focus on asking the respondent to describe how he or she would set up and solve a problem
- the use of a simple, four-function calculator to solve quantitative problems

In addition to information gathered through the administration of the simulation tasks, demographic and personal background information is important for interpreting and reporting the literacy results. Thus, a key instrument for the survey is a background questionnaire, which along with the literacy scales provides the means to link NALS to other literacy assessments.

Linking NALS to Other Literacy Assessments

One of the major goals of the National Adult Literacy Survey is to compare its results to those from other large-scale assessments of literacy that have been conducted during the past few years. These include the YAL assessment conducted in 1985 by ETS for NAEP and the DOL literacy assessment conducted by ETS.

In order for comparisons to be made, a significant number of simulation tasks used in both the YAL and DOL assessments are included in the NALS. The use of a common set of exercises in the three assessments permits the comparison of demonstrated literacy proficiencies on the three scales among the various populations surveyed. For example, comparisons can be made between the literacy skills demonstrated in the YAL assessment and those of the current cohort of 21- to 25-year-olds. Furthermore, how literacy skills develop and change over time can be explored by examining the results for the 28- to 33-year-old NALS participants who were in the age range of 21- to 25-years old in 1985. Moreover, comparisons can be made between adults who are eligible for or participating in JTPA, ES, and UI programs and adults in selected subgroups from the NALS.

In addition to the use of a common set of simulation tasks, NALS includes background questions that were used in both of the prior surveys. The inclusion of these questions enhances the comparability of the NALS data with the data collected by both the YAL and the DOL assessments.

Summary

The National Adult Literacy Survey is based on the concept that literacy involves a broad range of skills that are used in a variety of adult contexts. It measures literacy through the administration of tasks that simulate the literacy demands that adults encounter in their daily lives. The framework for the survey encompasses three distinct areas of literacy — prose, document, and quantitative — each of which is measured along a continuum or scale. Such a framework presents literacy as a set of complex information processing skills and, thus, represents the multifaceted nature of the construct of literacy.

Chapter 3

Development of the Background Questionnaire

One of the goals of the National Adult Literacy Survey (NALS) is to relate the literacy skills of the nation's adults to a variety of demographic characteristics and explanatory variables. To accomplish this, the NALS includes the administration of a background questionnaire as well as literacy performance measures. The questionnaire is intended to provide data that will characterize the adult population of the United States, enhance the understanding of the factors that are related to the observed distribution of literacy skills of the population, and enable comparisons with previous studies. In addition, a version of the questionnaire was developed for the incarcerated adults as some of the questions for the population at large are not relevant to this small subgroup.

The Scope of the Background Questionnaire

As recommended by the Literacy Definition Committee, two goals guided the development of the questionnaire:

- to ensure the usefulness of the data by addressing issues of concern given the national scope of the survey
- to ensure comparability with the YAL survey and the DOL literacy assessment by including some identical questions

With these goals in mind, the background questionnaire addresses the following broad issues:

- general and language background
- educational background and experiences
- political and social participation
- labor force participation
- literacy activities and collaboration
- demographic information

The following sections deal with each of these issues and describe in detail the specific information gathered.

General and Language Background. By design, the NALS is a study of English literacy proficiency. Projected demographic changes, however, point to a large and growing population of adults with limited English proficiency. Experience suggests that little or no information from the simulation tasks in English will be available for these individuals and, thus, they can be characterized only from the information collected in the background questionnaire. In addition, many of the questions included in this category were important in characterizing the sample of young adults in the young adult literacy assessment; and, in fact, the age at which English was learned was found to be a powerful variable in the relational analyses for the young adults. In order to gather as much pertinent information as possible, the

questions relating to respondent's general and language background address the following:

- country of birth
- education before coming to the United States
- language(s) spoken by others in the home
- language(s) spoken while growing up
- language(s) spoken now
- participation in courses for English as a second language
- self-evaluation of proficiency in English and other languages

Educational Background and Experiences. Although we can still find "self-educated" individuals, formal education remains among the most important factors in the acquisition of literacy skills. Level of education is known to be an important predictor of demonstrated performance on the prose, document, and quantitative literacy scales across racial/ethnic groups. The questions addressing educational background and experiences are designed to provide data for descriptive and relational analyses as well as to address some specific issues. The questions collect information on the following:

- highest grade or level of education completed
- reasons for not completing high school
- high school equivalency
- current educational aspirations
- types and duration of training received in addition to traditional school
- context, that is, school, home, or work, in which literacy activities were learned
- physical, mental, or health conditions that may affect literacy skills

Political and Social Participation. People need to read, write, and calculate in order to accomplish important tasks not only at work and in school, but also at home and in their communities. The questions included under political and social participation will make it possible to explore the kinds of free-time activities that adults engage in relative to demonstrated proficiencies. Use of library services is important because libraries promote reading and often provide literacy programs. In addition, because an informed citizenry is essential to political participation and printed material is an important medium for conveying public issues, information will be collected on how adults keep abreast of current events and public affairs. The questions in this section address the following:

- sources for obtaining information about current affairs
- television viewing
- use of library services
- voting behavior

Labor Force Participation. There is widespread concern that the literacy skills of both our present and future work forces are not adequate for competing in the current global economy or for coping with our rapidly evolving technological society. The questions relating to labor force participation are based on standard labor force concepts widely used in economic surveys and will allow a variety of labor market activity and experience variables to be con-

structed. Combined with the data on the demonstrated literacy proficiencies of adults, the labor market variables can be used to examine associations between literacy proficiencies and the labor market problems and experiences of key subgroups. In addition, the questions included will make it possible to link results to the DOL literacy survey. The questions in this section address the following:

- employment status
- weekly wages or salary
- weeks of employment for the last year
- annual wages or salary
- industry and occupation

Literacy Activities and Collaboration. Questions relating to literacy activities and collaboration will address several important issues. Some of the questions will provide information about the types of materials — newspapers, magazines, books, and brief documents — that adults read. Thus, the information collected will make it possible to investigate the relationship between the types of materials read and demonstrated literacy proficiencies. Another subset of questions asks about the frequency of particular reading, writing, and mathematics activities engaged in for personal use as well as for use on the job. By asking adults about the types of literacy practices they engage in specifically for work, analyses can relate on-the-job literacy practices to various occupational categories, education levels, and income levels. The issue of collaboration is addressed by questions that ask if a person receives assistance when engaging in particular literacy activities. The questions in this section collect information on the following:

- newspaper, magazine, and book reading practices
- reading, writing, and mathematics activities engaged in for personal use
- reading, writing, and mathematics activities engaged in for work
- assistance received from others with particular literacy activities

Demographic Information. The inclusion of demographic variables will make it possible to describe the adult population as well as to investigate the demonstrated literacy proficiencies of major subgroups of interest, such as racial/ethnic groups, males and females, and age groups, including those over the age of 64. In addition, the data will allow for the investigation of such issues as the educational experiences of White, Black, and Hispanic populations as well as their access to literacy related services; the educational experiences of different generations of adults; and the relationships of socioeconomic status and family background to literacy. The demographic information that will be collected includes the following:

- educational attainment of parents
- marital status
- number of people in family employed full-time and part-time
- sources of income other than employment
- family and personal income from all sources
- race/ethnicity
- age
- gender

Incarcerated Background Questionnaire

Because many of the questions for the household population are not appropriate for an incarcerated population, a more relevant version of the background questionnaire incorporating questions from the 1991 Survey of Inmates of State Correctional Facilities was developed. The inmate survey is sponsored by the Bureau of Justice Statistics of the U.S. Department of Justice.

Most of the questions in the household survey questionnaire that deal with general and language background and with literacy activities and collaboration remain in the incarcerated questionnaire. Many of the questions dealing with education, however, were either revised or replaced with questions from the 1991 inmate survey. These questions better reflect the educational experiences of inmates both prior to their incarceration and while in prison. The questions pertaining to political and social participation in the household questionnaire were replaced with questions from the 1991 inmate survey dealing with current offenses and criminal history. Some of the questions in the household questionnaire dealing with labor force participation were replaced with questions about inmate's prison work assignments. Several questions dealing with family income and employment status of family members — appropriate for the household population, but not for the incarcerated — were dropped from the demographic section of the questionnaire. As a result of these changes, the questionnaire for the incarcerated population addresses the following major topics:

- general and language background
- educational background and experiences
- current offenses and criminal history
- prison work assignments and labor force participation
- literacy activities and collaboration
- demographic information

Administering the Questionnaires

Each of the background questionnaires is designed to take about 15 minutes to administer. To ensure standardized administration, the questionnaire is read to the respondent by a trained interviewer. For some of the questions, the respondent receives a card showing response alternatives as the interviewer reads them aloud. These procedures for administering the questionnaire serve to minimize or eliminate the need for the respondents to call upon reading skills in order to respond to the questions.

Both the household and incarcerated questionnaires were translated into Spanish and administered by bilingual interviewers. Spanish is the second most prevalent language in this country; the non-English, non-Spanish language groups are not prevalent enough across the country as a whole that other translations would be practical for survey work. In addition, many Hispanic respondents may not be able to complete the assessment's simulation tasks in

English; thus, it was considered important to collect background information in order to understand particularly the language background and literacy experiences of that group. Since the survey is intended to assess only the *English* literacy skills of the population, the simulation tasks were not offered in Spanish.

Summary

With the information gathered by the background questionnaires, it will be possible to characterize the demonstrated literacy skills of the nation's adults in terms of demographic and personal background information. The household questionnaire was modified for the incarcerated population, particularly to collect information about inmates' current offenses and criminal history as well as their educational experiences while in prison. Both the household and the incarcerated questionnaires were translated into Spanish. These various background questionnaires will make it possible to issue reports tailored to various audiences, including the adult education community, the business community, and the correctional education community. In addition, the results from the survey can be compared with those from the YAL assessment, the DOL literacy survey, and the 1991 inmate survey.

Chapter 4

Development of the Simulation Tasks

The National Adult Literacy Survey (NALS) measures literacy along three scales — prose, document, and quantitative. These scales comprise literacy tasks that simulate the demands that adults encounter when they interact with printed materials on a daily basis. The tasks that are being administered in the NALS include about 85 tasks that were administered in the YAL assessment and the DOL literacy survey and about 80 tasks that were developed specifically for this survey. The administration of a common pool of tasks in each of the three surveys allows for the calibration of the scales to permit valid comparisons of results across their different populations.

The framework used to develop the new tasks reflects research that was conducted on the tasks from the YAL assessment, particularly with respect to the processes and strategies involved in completing the tasks. Thus, the newly developed tasks serve to refine and extend the three existing literacy scales. Furthermore, because about two-thirds of the original tasks contribute to the document scale alone, new tasks were needed to provide a better balance of tasks among the three literacy scales.

This chapter describes the development of the new tasks in terms of the framework that is modeled after the approach of the YAL survey. In addition, the scope of the combined pool of tasks — that is, the original tasks plus the newly developed tasks — is outlined in terms of this framework. Finally, the process of grouping the tasks into blocks or sections and then assembling these blocks into booklets for administration is described.

Organizing Framework for Task Development

In developing the new tasks, one goal was to complement the tasks on the three literacy scales — prose, document, and quantitative — developed for the young adult assessment. This means including a diversity of stimulus materials and designing tasks that represent the broad range of skills and processes inherent in the three domains of literacy. Furthermore, the tasks are designed to assess a wide variety of skills that reflect the demands that adults encounter in occupational, community, and home settings — skills that involve reading, writing, and computing. Because the tasks are meant to simulate the kinds of activities that people engage in when they use printed materials, they are open-ended.

The underlying principle for the development of the new tasks is that demonstrated performance on any given task reflects the interactions among the following:

- the structure of the stimulus material, e.g., exposition, narrative, table, graph, map, or advertisement
- the content represented and/or the context from which the stimulus is drawn, e.g., work, home, community
- the nature of what the individual is asked to do with the material, i.e., the purpose for using the material that guides the strategies needed to complete the task successfully

As demonstrated by research based on the performance of the young adult literacy tasks, these factors, operating in various combinations, affect the difficulty of a task and, therefore, its statistical characteristics and position relative to other tasks along a given literacy scale.[14]

Materials/Structures

The stimulus materials selected for the tasks reflect a variety of structures or linguistic formats that adults encounter in their daily activities and are reproduced in their original format. Most of the prose materials used in the survey are expository — that is, they describe, define, or inform — since much of the prose that people read is expository in nature; however, narrative and poetry are included as well. The expository materials include a diversity of linguistic structures, from texts that are highly organized both topically and visually to those that are loosely organized. They also include texts of varying lengths, from full-page magazine articles to short newspaper articles of several paragraphs.

The document tasks are based on a wide variety of document structures which are categorized as tables, charts and graphs, forms, maps, and miscellaneous documents. Tables include matrix documents in which information is arrayed in rows and/or columns, such as transportation schedules and lists or tables of information or data. Documents that are categorized as charts and graphs include pie charts, bar graphs, and line graphs. Forms are any documents that require information to be filled in, and miscellaneous structures include such materials as advertisements and coupons.

The quantitative tasks involve performing arithmetic operation on numbers embedded in print and are, therefore, tied to some kind of stimulus material. The materials for quantitative tasks include both prose and document structures as there are no structures that are unique to quantitative tasks. A majority of these tasks, however, are based on document structures.

Table 4.1 indicates the percentages of tasks — both the original young adult and the new as well as the total — that are based on the various categories of structures. While it may seem that there is a disproportionate number of tables, this particular structure comprises a wide range of materials that present information in matrix formats using words, numbers, pictures, and symbols. Thus, materials such as transportation schedules, menus, tables of contents, as well as tables of information or data, are categorized as this structure.

[14] Irwin S. Kirsch and Peter Mosenthal, "Exploring Document Literacy: Variables Underlying the Performance of Young Adults," *Reading Research Quarterly* (25, 1990): 5-30.

Table 4.1. Percentages of Tasks by Categories of Structures

Structure	Percent of Tasks Original	New	Total
Exposition	6	15	21
Narrative/Poetry	1	5	6
Tables	23	10	33
Charts and Graphs	4	6	10
Forms	13	6	19
Maps	1	2	3
Miscellaneous	4	4	8

Adult Contexts/Content

Since adults do not read printed materials in a vacuum but read within a particular context or for a particular purpose, materials are used that represent a variety of contexts or content. Six adult context/content areas have been identified as follows:

- **home and family:** interpersonal relationships, personal finance, housing, and insurance
- **health and safety:** drugs and alcohol, disease prevention and treatment, safety and accident prevention, first aid, emergencies, and staying healthy
- **community and citizenship:** community resources and being informed
- **consumer economics:** credit and banking, savings, advertising, making purchases, and maintaining personal possessions
- **work:** occupations, finding employment, finance, and being on the job
- **leisure and recreation:** travel, recreational activities, and restaurants

With respect to selecting contexts and contents, an attempt was made to include as broad a range as possible as well as to select universally relevant contexts and contents. This would ensure that they would not be so specialized as to be familiar only to certain groups and that any disadvantages for people with limited background knowledge would be minimized.

Table 4.2 presents the percentages of tasks — both the original young adult and the new plus the total — that are based on the various context/content categories. While it may seem that there is an overrepresentation of materials that fall into the community and citizenship category, this category is very broad and includes such materials as news articles from newspapers and magazines, information from county, state, and federal governmental agencies, transportation schedules, information from schools and colleges, and so on.

The materials and contexts described above define the axes of the matrix in Table 4.3. The cells with a dot indicate that tasks, new and/or young adult, based on that particular combination of material and context are included in the assessrment. About 90 percent of the prose stimulus materials are expository in nature, as reflected in the distribution of expository materials across all the

Table 4.2. Percentages of Tasks by Categories of Context/Content

Context/Content	Percent of Tasks Original	New	Total
Home/Family	7	7	14
Health/Safety	3	1	4
Community/Citizenship	12	20	32
Consumer Economics	11	5	16
Work	13	2	15
Leisure/Recreation	6	13	19

context/content areas. For the purposes of the NALS, reading narrative and poetry is considered a leisure activity, and so none of the other context/content areas is represented by narrative and poetry. The design for the survey did not require that tasks cover all possible combinations of materials and contents or contexts.

Processes/Strategies

After the stimulus materials were selected, tasks were developed that simulate the way people would use the materials and that require different strategies for successful task completion. Prose tasks were developed that involve three strategies for processing information: locating, integrating, and generating information. For *locate* tasks, readers must match on information given in the question with either literal or synonymous information in the text (see tasks 11 and 12, page 34). *Integrate tasks* require readers to pull together two or more pieces of information located at different points in the text. *Generate tasks* require readers not only to process information located at different points in the text, but also to go beyond that information by drawing on their knowledge about a subject or by making broad text-based inferences in order to produce new information (see tasks on pages 35 and 36).

Of the original prose tasks, about one-third are locate tasks while the remaining two-thirds are generate tasks. Of the new prose tasks developed for the survey, about two-thirds are locate tasks, one-fourth integrate tasks, and the remainder generate tasks. Of the total item pool — the original and new combined — slightly over half the tasks are locate, just under a third are generate, and the remainder are integrate tasks.

The strategies required by document tasks also include locating, integrating, and generating information as well as cycling through information. For locate tasks, readers must match on one feature or category of information given in the task with either identical or synonymous information in a document (see task on Social Security card, page 37). *Cycle tasks* require the reader to repeat the matching process by identifying all instances that satisfy a set of conditions stipulated in the question or directive (see task on employment

Table 4.3. Matrix of Context by Materials

	MATERIALS						
CONTEXT/CONTENT	Exposition	Narrative/Poetry	Tables	Charts/Graphs	Forms	Maps	Miscellaneous
Home/Family	•		•		•		•
Health/Safety	•		•				
Community/Citizenship	•		•	•	•	•	
Consumer Economics	•		•	•	•		•
Work	•		•	•	•		•
Leisure/Recreation	•	•	•	•		•	•

form, page 37). In completing integrate tasks, readers must either match on two or more features located in different parts of the document or compare and/or contrast information (see task on page 39). As with prose generate tasks, document generate tasks require readers to go beyond information in the document either by drawing on their knowledge of the subject or by making inferences to produce new information.

About two-thirds of the original document tasks are locate, with the remaining tasks about evenly divided among the integrate, generate, and cycle categories. Of the new document tasks, about two-thirds are locate tasks as well, and about one-fourth are integrate tasks, and the remainder are generate tasks; there are no cycle tasks. Of the total document pool, about two-thirds are locate tasks and one-tenth each are generate and cycle tasks with the remaining tasks categorized as integrate.

Quantitative tasks require readers to perform arithmetic operations — addition, subtraction, multiplication, or division — either singly or in combination. For some tasks, the type of operation is obvious from the wording of the question or directive (see task on page 41), while for other tasks readers must infer which operation they should perform (see number 4 on page 42 and the task on page 43). Similarly, sometimes the numbers that are required to perform the operation are easily identified (see task on page 41), while for other tasks the required numbers may be embedded in text that has distractors or other numbers that might seem plausible to use in setting up the problem (see task number 5, page 42 and the task on page 43). In addition, some tasks require readers to explain how they would solve a problem rather than just producing a numerical answer (see task on page 43), and others require the use of a simple, four-function calculator to solve the problem. The representation of numerical information associated with the quantitative tasks includes whole numbers, decimals, percentages, fractions, and time (hours and minutes).[15]

Of the original quantitative tasks, about one-fourth each are categorized as addition and subtraction. About one-third of the tasks involve a combination of operations and the remaining tasks are evenly divided between the operations of multiplication and division. The new quantitative tasks are fairly evenly distributed across the five types of operations, with there being slightly more subtraction and slightly fewer division tasks than the other three kinds. Across the total quantitative pool, about one-fourth each are addition, subtraction, and combination tasks, with about an even number of multiplication and division tasks making up the remaining tasks.

The materials and processes described above define the axes of the matrix in Table 4.4. The cells with a dot indicate that tasks with that particular combination of material and process are included in the pool of literacy tasks for the assessment. For

[15] For more detail and examples of the kinds of prose, document and quantitative tasks, see Irwin S. Kirsch, Ann Jungeblut, and Anne Campbell, *Beyond the School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor*. Princeton, NJ: Educational Testing Service, September, 1992.

example, some tasks based on expository materials require subtraction, but there are no expository-based tasks requiring addition. The design for the survey did not require that tasks cover all possible combinations of materials and processes.

Given the strategies for processing information that are required, the tasks are open-ended rather than multiple choice. That is, they require readers to engage in activities that are similar to those they might perform if they actually encountered the materials and, thus, are not constrained by an artificial set of response requirements. Examples include reading and responding to editorials, news stories, and classified listings in a newspaper; writing a letter to a credit department; explaining the differences between two types of job benefits; completing a bank deposit slip; writing a check; keeping a running balance in a check ledger; and filling in a form to order merchandise from a catalog.

Because the tasks are open-ended, they require a variety of response modes. For some tasks, the respondents are asked to underline or circle information in the stimulus or copy information from it. For tasks that require completing a form, respondents copy information from the directive or question onto the form. In some cases, the information to be copied involves numbers that are then used to perform an arithmetic operation. Other tasks require respondents to produce an answer, such as making inferences based on information in the stimulus or explaining how to set up and solve a quantitative problem. Incorporating a variety of response modes ensures that the simulation tasks reflect real-life uses of printed materials.

Task Difficulty

Each of the types of tasks described above extends over a range of difficulty on the three scales. The difficulty of a particular task is a result of the interaction of the type of process or strategy required by the task with other variables. For the prose and document tasks these other variables include:

Table 4.4. Matrix of Materials by Process

	MATERIALS						
PROCESS	Exposition	Narrative/Poetry	Tables	Charts/Graphs	Forms	Maps	Miscellaneous
Locate	•	•	•	•	•	•	•
Integrate	•	•	•	•		•	
Generate	•	•	•	•			
Cycle					•	•	•
Add			•	•	•	•	•
Subtract	•		•	•	•		•
Multiply	•			•	•		
Divide	•		•	•			•
Combination			•		•		•

- the number of categories or features of information in the directive that the reader has to process
- the number of categories or features of information in the text or document that can serve as distractors or plausible answers
- the degree to which the information given in the question has less obvious identity with the information stated in the text or document
- the length and density of the text or the structure of the document

Two tasks based on a newspaper article about a marathon swimmer (reprinted in the appendix, page 34) are examples of how these variables may interact to affect difficulty. The first directive requires the reader to match "banana and honey sandwiches, hot chocolate, lots of water and granola bars" in the third paragraph with the word "ate" in the directive. There are no distractors as the article contains only one reference to food eaten during the swim. As a result, this task is one of the easiest on the prose scale. The second task directs the reader to identify the age at which Ms. Chanin began swimming competitively. In this instance, the swimmer's current age of 23 appears early in the text and serves as a distractor for when she began competing, which is given later in the article as age 15. Although the stimulus material is the same and both tasks require locating information, the presence of the distractor serves to make the second task significantly more difficult than the first.

An analysis of quantitative tasks has shown that the information processing required to complete the tasks affects their difficulty. In general, it appears that many adults can perform simple arithmetic operations when both the numbers and the types of operation are made explicit. The tasks become increasingly difficult, however, when these same operations are performed on numbers that must be located and extracted from different types of texts or documents that contain plausible but irrelevant numbers, or when these operations must be inferred from the directive. As a result, the difficulty of quantitative tasks seems to be a function of:

- the particular operation called for
- the number of operations needed to perform the task
- the extent to which the numbers are embedded in printed materials
- the extent to which an inference must be made to identify the type of operation to perform

For example, one of the least demanding of the quantitative tasks requires the reader to enter and total two amounts on a bank deposit slip (see appendix, page 41). For this task, both the numbers and the operation are judged to be easily identified, and the operation involves the simple addition of two decimal numbers that are set up in a column format and do not require carrying. A significantly more difficult task requires the reader to compute the cost of a meal and then to determine the correct change from a specified amount (see appendix, page 42). Several factors interact to affect the difficulty of this task: two operations are required; the numbers needed to compute the cost of the

meal are found in different parts of the menu; and an inference must be made to identify the types of operations to perform.

Because the NALS is being administered to a nationally representative sample, it is important to capture the full range of literacy skills that people possess and not just to focus on those adults who may have low level literacy skills. The tasks included in the survey, therefore, cover a range of difficulty across each of the scales. Thus, one goal in developing the new literacy tasks was to extend and refine the literacy scales as represented by the tasks from the young adult literacy assessment. The number of tasks on each scale, including both the original young adult and the new, that are judged to be easy, average, and hard is shown in Table 4.5.

Assembling the Tasks for Administration

From a pool of about 110 new tasks developed for the survey, about 80 tasks were selected and assembled into seven blocks or sections. Each block is designed to take about 15 minutes of administration time. In assembling the new blocks, the following factors were taken into account:

Table 4.5. Distribution of Tasks by Difficulty across the Scales

	Prose	Document	Quantitative	Total
Easy	5	13	7	25
Average	22	57	27	106
Hard	14	11	9	34
Total	**41**	**81**	**43**	**165**

- the inclusion of roughly an equivalent number of tasks from each of the three literacy scales
- the inclusion of a broad range of content from the identified adult contexts
- the inclusion of a wide variety of materials and structures
- a range of difficulty across the tasks as determined from field-test data
- representation of content relating to various racial/ethnic groups
- a variety of response modes
- the assignment of all the quantitative tasks requiring the use of a calculator to one block

Of the tasks that were selected for the final survey, 27 were selected from the prose scale, 25 from the document, and 28 from the quantitative. These tasks were distributed as evenly as possible across the seven new blocks. Because the new item pool could in and of itself became the basis of a future assessment, it was deemed more important to include a balanced number of new tasks from each scale rather than to achieve balance across the entire pool of both original and new tasks (see Table 4.5 for the total number of tasks by scale — both original and new — included in the survey).

With respect to achieving balance in content relating to various racial/ethnic groups, it is important to note that balance is achieved across the entire set of stimulus materials used in the survey — the ones for the newly developed tasks plus the original young adult materials — not just within one block. About 55 percent of the stimulus materials are neutral

with respect to both gender and race/ethnicity — that is, they do not contain any references to people. In the remaining materials, the references to men and women are about equal, and references to specific racial/ethnic minority groups are found in about 25 percent of the materials. In the remaining 75 percent, the references are either neutral with respect to race/ethnicity or the race/ethnicity of the person referred to is identifiable only if someone might have background knowledge about that particular person.

In addition to seven blocks of new tasks, a core set of six literacy tasks — two from each of the three scales — was assembled. These tasks are relatively easy and serve as transition from the background questionnaire to the simulation tasks. The core is designed to take five to 10 minutes to complete.

The full set of 165 tasks ensures broad, balanced, and representative coverage of materials and content; however, it would take about three and a half hours for each respondent to complete that number of tasks. Because about 45 minutes of response time was thought to be a maximum that respondents could reasonably be expected to spend on the literacy tasks, some form of item sampling procedure was essential. The design most suitable for this purpose is a powerful variant of standard matrix sampling called balanced incomplete block (BIB) spiralling. In BIB spiralling, as in standard matrix sampling, no respondent is administered all of the tasks in the assessment pool. Unlike standard matrix sampling, however, in which items or tasks are assembled into discrete booklets, BIB spiralling allows for the estimation of relationships among all the tasks in the pool through the unique linking of blocks.

With this approach, the 13 blocks of tasks — the seven new blocks and the six young adult and DOL blocks — were assembled into 26 assessment booklets, each of which contained a unique combination of three blocks. In addition, each booklet included the section of core tasks. The application of the BIB design resulted in the configuration of booklets, as shown in Table 4.6. In this design, each block appeared with the same frequency — in six of the 26 booklets — and each block was paired one time with every other block. Position effects were also controlled for at the block level since each block appeared twice in each of the possible positions in the booklets — first, middle, and last.

The spiral component of the design orders the books for administration so that each booklet is completed by a random sample of respondents. One outcome of the BIB spiral design is that every task is taken by a randomly equivalent subsample of respondents. This ensures that reliable estimates of population performance can be calculated for every task. An additional benefit of this methodology is that every pair of tasks is taken by a representative subsample of the total sample so that correlations between pairs of tasks can be estimated.

Table 4.6. Balanced Incomplete Block Design for 26 Booklets

Booklet	Core	Blocks		
1	C	1	2	13
2	C	2	3	9
3	C	3	4	7
4	C	4	13	8
5	C	13	9	6
6	C	9	7	10
7	C	7	8	11
8	C	8	6	12
9	C	6	10	5
10	C	10	11	1
11	C	11	12	2
12	C	12	5	3
13	C	5	1	4
14	C	1	3	8
15	C	2	4	6
16	C	3	13	10
17	C	4	9	11
18	C	13	7	12
19	C	9	8	5
20	C	7	6	1
21	C	8	10	2
22	C	6	11	3
23	C	10	12	4
24	C	11	5	13
25	C	12	1	9
26	C	5	2	7

Summary

The underlying principle guiding the development of the simulation tasks is that demonstrated performance on any given literacy task is influenced by the structure of the text, the context from which it is drawn, and the strategies employed to complete the task. Thus, the simulation tasks are meant to cover a range of materials, contexts, and strategies and require a variety of response modes. Criteria for selecting the tasks for administration include achieving a range of difficulty, a representation of content relating to various racial/ethnic groups, and a balance in the kinds of tasks — that is, prose, document, and quantitative. Given the time allotted to the administration of the literacy tasks, balanced incomplete block spiralling was employed.

Chapter 5

State Adult Literacy Surveys

The goal of any assessment is to conduct a study that provides reliable and valid information on a representative sample of some population — in this case, adults over the age of 16 residing in households in the United States. In accomplishing this goal for the National Adult Literacy Survey, it will be possible to report on the literacy skills of the nation; however, not every state will be part of the national sample and adults sampled within a particular state will not necessarily be representative of the population of that state.

The State Adult Literacy Survey Option

To provide states with an opportunity to understand better the literacy skills of their particular populations, each of the 50 states was invited to participate in a concurrent survey that will provide results comparable with those of the national study. To accomplish this, the survey instruments — that is, the background questionnaire and simulation tasks — used in the state surveys were to be identical to the ones used in the national survey, and the data were to be collected within the same time frame as the national.

To make the opportunity available to states, a letter of invitation describing the nature of the study, the two available models and their associated costs, and a time line was sent to state directors of adult education, state directors of JTPA programs, state literacy initiative directors, and governors. One available model assumed that ETS and Westat would be responsible for all aspects of the literacy survey within the state. The other model assumed that the state agency or its designated unit would take responsibility for recruiting and supervising staff to prepare the listing of residential addresses for sample selection and to conduct the survey at selected households. Under both models, ETS and Westat would draw the sample, provide survey instruments, conduct training of field staff, score and analyze the data, and report the results.

The Participating States

While many states expressed an interest in conducting a concurrent state literacy survey, 12 states entered into a contract with ETS to conduct such a survey. These states are:

California	New Jersey
Florida	New York
Illinois	Ohio
Indiana	Pennsylvania
Iowa	Texas
Louisiana	Washington

All states selected the first model whereby ETS and Westat would be responsible for all aspects of the survey, including recruiting and supervising staff to conduct the survey.

The State Samples

Each state sample includes 1,000 adults aged 16 to 64. While the national sample includes adults over the age of 64, an age limit was placed on the state samples because the original design for the national sample called for such a limitation and the age eligibility was expanded after state contracts had been negotiated.

The state sample design is intended to provide data that are representative of the state as a whole; however, the sample of 1,000 participants will not be large enough to be representative of local communities. The state data will provide information by degrees of urbanization within the state. In addition, the data will provide precise estimates of literacy proficiencies for single variables of interest, such as gender, education level, age ranges, and work force participation, but the sample size imposes limitations on interpretations extended to cross-tabulations involving combinations of variables.

As noted above, the instruments administered in the state surveys are identical to the national survey instruments and the state and national data will be collected during the same time frame. As a result, data collected in a state as part of the national sample will be used to extend and supplement the data from the specific state sample. The supplemental data from the national sample, however, may not sufficiently increase the representation of subpopulations of interest within a particular state.

The Background Questionnaire

Although the national background questionnaire gathers a wealth of information about respondents, the participating states were given the opportunity to include up to five additional questions that would give them the opportunity to collect information pertinent to their particular state. The criteria for these questions were that they had to be concerned with information that is directly related to the subject of literacy and they could not be rewordings of questions in the national questionnaire. These questions are included at the back of the national questionnaire and are asked of all respondents in a participating state, regardless of whether they are in the national or state sample. Thus, the background data can be fully supplemented by the national sample as described above.

Reporting the State Results

As a result of their participation in the concurrent state literacy survey, the 12 states will be able to compare their data directly with the national data. Each participating state will receive a report discussing the demonstrated performance of adults aged 16 to 64 on each of the three literacy scales — prose, document, and quantitative — using one-way analysis by gender, major racial/ethnic groups, age groups, and other variables, such as educational attainment, current

employment status, and language background. Furthermore, a computer tape containing complete responses to the background questions and simulation tasks as well as a data compendium will enable states to conduct further analyses. Overall, the states will have available important baseline information that will aid them in planning literacy programs and in gauging progress in addressing the literacy needs of their populations.

Summary

Twelve states conducted a concurrent literacy survey that will provide reliable and valid estimates of the literacy skills of adults aged 16 to 64 residing in their states. It will also enable the states to compare their results with those of the national survey. In order to accomplish these ends, the background questionnaire and simulation tasks administered in the state survey were identical to those for the national survey, and they were administered during the same time period. Reports on the state surveys will be issued following the reports on the National Adult Literacy Survey in 1993.

Participants in the Development Process

Educational Testing Service appreciates the efforts of the many individuals who contributed to the development of the National Adult Literacy Survey. This particular report is the outcome of the discussions and recommendations of the Literacy Definition Committee (LDC). Special thanks are due the members of this committee, who reached a consensus on a definition of literacy, guided the development and selection of the simulation tasks, and reviewed this report. Appreciation is also due the Technical Review Committee (TRC), who reviewed the survey instruments and this report, as well as provided technical assistance and expertise on the conduct of the survey.

In addition, we would like to acknowledge the members of two other committees that were appointed to advise ETS and Westat, as well as the LDC and the TRC, with respect to the elderly and incarcerated populations. The Literacy of Older Adults Review Group was formed to represent the literacy interests and concerns of senior citizens, particularly with respect to problems that may have been encountered in administering the survey to this population. The Literacy of Incarcerated Adults Review Group was appointed to represent the literacy interests and concerns for the incarcerated population with respect to the design, analysis, and reporting of results.

The development process was directed by Irwin Kirsch, the NALS project director, and Anne Campbell, director of test development for the NALS. Test developers from ETS' Secondary and Higher Education Programs as well as outside item writers are gratefully acknowledged for their efforts in writing tasks for the survey. The staff at Westat provided invaluable assistance in developing both the household and incarcerated background questionnaires. Appreciation is also due Ann Jungeblut for her reviews of the survey instruments at various stages of development.

The project monitor for the NALS is Andrew Kolstad from the National Center for Education Statistics, U.S. Department of Education. His attention to detail and careful review of project deliverables are greatly appreciated.

Finally, we would like to thank the reviewers of this report for their thoughtful and helpful comments.

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Sample Tasks

This appendix contains sample passages and items classified by scale, structure, and process. In addition, the scoring guide is provided for each task. An asterisk next to a score point indicates the correct answer. These questions are for illustrative purposes only and in no way represent the full range of tasks included in the assessment.

Prose Tasks

Material/Structure: Exposition **Process/Strategy: Locate**

Find the article "Swimmer completes Manhattan marathon" on page 2 of the newspaper provided and answer the following questions.

11. Underline the sentence that tells what Ms. Chanin ate during the swim.

12. At what age did Chanin begin swimming competitively? _____

Swimmer completes Manhattan marathon

The Associated Press

NEW YORK—University of Maryland senior Stacy Chanin on Wednesday became the first person to swim three 28-mile laps around Manhattan.

Chanin, 23, of Virginia, climbed out of the East River at 98th Street at 9:30 p.m. She began the swim at noon on Tuesday.

A spokesman for the swimmer, Roy Brunett, said Chanin had kept up her strength with "banana and honey" sandwiches, hot chocolate, lots of water and granola bars."

Chanin has twice circled Manhattan before and trained for the new feat by swimming about 28.4 miles a week. The Yonkers native has competed as a swimmer since she was 15 and hoped to persuade Olympic authorities to add a long-distance swimming event.

The Leukemia Society of America solicited pledges for each mile she swam.

In July 1983, Julie Ridge became the first person to swim around Manhattan twice. With her three laps, Chanin came up just short of Diana Nyad's distance record, set on a Florida-to-Cuba swim.

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Scoring guide for "Swimmer completes Manhattan marathon"

11. *1: Underlines, circles, or puts a mark next to the sentence beginning *A spokesman for the swimmer,* or underlines, circles, or puts a mark next to any part of the sentence that just lists the foods.
2: Underlines, circles, or puts a mark next to any other sentence.
9: I don't know.
0: No response

12. *1: 15. Accept underlining or circling age or the sentence containing the age in the article.
2: Anything other than 15.
9: I don't know.
0: No response (blank)

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Prose Tasks

Material/Structure: Exposition **Process/Strategy: Generate**

8. What argument is Tom Wicker making in his column?

_____

_____

_____

_____

Did U.S. know Korean jet was astray?

Tom Wicker

THE COMPLICITY with government into which the press has sunk since Vietnam and Watergate has seldom been more visible than on the first anniversary of Soviet destruction of Korean Air Lines Flight 007.

On Sept. 1, headlines, of course, reported the Reagan administration's statements that the event had lionized, during the year, U.S. standing in the world relative to that of the U.S.S.R.

But the press effectively ignored an authoritative article in The Nation (for Aug. 13-20) establishing to a reasonable certainty that numerous U.S. government agencies knew or should have known, almost from the moment Flight 007 left Anchorage, Alaska, that it was off course and headed for intrusion into Soviet air space, above some of the most sensitive Soviet military installations.

Yet no agency, military or civilian, warned Flight 007 or tried to guide it out of danger; neither did the Japanese. As late as Aug. 28, in a briefing, a State Department spokesman claimed "no agency of the U.S. government even knew the plane was off course and was in difficulty until after it was shot down."

If that's true, the author of The Nation's article—David Pearson, an authority on the Defense Department's World Wide Military Command and Control System, who spent a year researching his lengthy article—concludes, "the elaborate and complex system of intelligence, warnings and security that the U.S. has built up over decades suffered an unprecedented and mind-boggling breakdown."

But Pearson shows in excruciating detail why it's most unlikely there was any such "simultaneous failure of independent intelligence systems" of the Navy, Army, Air Force, National Security Agency, Central Intelligence Agency "or the Japanese self-defense agency"—all of which, he shows, had ability to track Flight 007 at various stages across the Pacific.

What's the alternative to the staggering idea of such a breakdown? That all these agencies deliberately chose not to guide the airliner back on a safe course, because its projected overflight of the Kamchatka Peninsula and Sakhalin Island would activate Soviet radar and air defenses and thus yield a "bonanza" of intelligence information to watching and listening U.S. electronic devices. Despite all administration protests to the contrary, the evidence Pearson presents raises this alternative at least to the high probability level.

But Pearson does not assert as a fact that the United States, South Korea or both deliberately planned an intelligence mission for Flight 007; he concedes the possibility that it simply "blundered" into sensitive Soviet air space, and the electronic snoopers for the United States decided on the spot to take intelligence advantage of the error—never dreaming the Russians would shoot down an unarmed airliner.

But if the disaster happened that way, Pearson notes, two experienced pilots (nearly 20,000 flying hours between them) not only made an error in setting the automatic pilot but "sat in their cockpit for five hours, facing the autopilot selector switch directly in front of them at eye level, yet failed to see that it was not [properly]." Nor in all that time could they have used the available radar and other systems to check course and position.

Pearson also presents substantial evidence that Soviet radar detection and communications systems over Kamchatka and Sakhalin were being jammed that night, which would help account for their documented difficulty in catching up to Flight 007. He reconstructs electronic evidence too, to show that the airliner changed course slightly after passing near a U.S. RC-135 reconnaissance plane; otherwise it would have crossed Sakhalin far north of the point where a Soviet fighter finally shot it down.

The jamming and course change, as detailed by Pearson, strongly suggest what he obviously fears: "that K.A.L. 007's intrusion into Soviet airspace, far from being accidental, was well orchestrated," with the Reagan administration, at some level, doing the orchestrating. Even if not, the deliberate silence—or shocking failure—of so many U.S. detection systems argue that President Reagan and the security establishment have greater responsibility for Flight 007's fate than they admit—or that a complaisant press has been willing to seek.

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Scoring guide for "Did U.S. know Korean jet was astray?"

8. *1: Argument identified. Respondents make a statement of the author's main point.

2: Argument not identified. Respondents tell what the article is about. Others may list evidence without stating what the argument is. Or they may use the prompt as a basis for personal digression.

9: I don't know.

0: No response (blank)

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Prose Tasks

Material/Structure: Poetry **Process/Strategy: Generate**

11. What is the poet trying to express in this poem? _____

_____

_____

_____

The pedigree of honey
Does not concern the Bee —
A clover, any time, to him
Is Aristocracy — **(Emily Dickinson)**

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Scoring guide for Dickinson poem

11. 1: No or unsatisfactory interpretation: Respondent makes an unsatisfactory or incomplete interpretation of the poem or provides a single word response or copies from the poem.

2: Literal interpretation: Respondent states a plausible summary of the poem or explains what the poem is about.

*3: Thematic interpretation: Respondent states a plausible theme of the poem. May also include other information, such as what the poem is about.

9: I don't know.

0: No response (blank)

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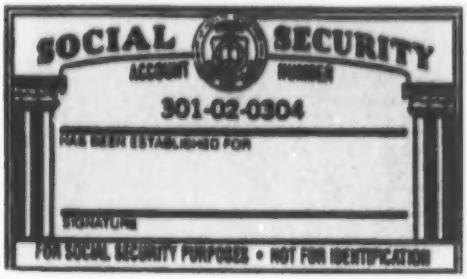
Document Tasks

Material/Structure: Form **Process/Strategy: Locate**



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Scoring guide for Social Security card

1. *1: Signs name or marks an X on the line.

   2: Any other response.

   9: I don't know.

   0: No response (blank)

Document Tasks

Material/Structure: Form **Process/Strategy: Cycle**

1. You have gone to an employment center for help in finding a job. You know that this center handles many different kinds of jobs. Also, several of your friends who have applied here have found jobs that appeal to you.

   The agent has taken your name and address and given you the rest of the form to fill out. Complete the form so the employment center can help you get a job.

   Birth date_____ Age____ Sex: Male____ Female____

   Height_____ Weight_____ Health_____

   Last grade completed in school_____

   Kind of work wanted:

   Part-time_____ Summer_____

   Full-time_____ Year-round_____

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Scoring guide for employment application

1a. Personal information: birth date, age, sex, height, weight, health, grade

   *1: Satisfactory completion of form portion.

   2: Unsatisfactory completion of form portion.

   9: I don't know.

   0: No response (both sections totally blank)

b. Job information: kind of work

   *1: Satisfactory completion of form portion, that is, at least one check in each column.

   2: Unsatisfactory completion of form portion.

   9: I don't know.

   0: No response (both sections totally blank)

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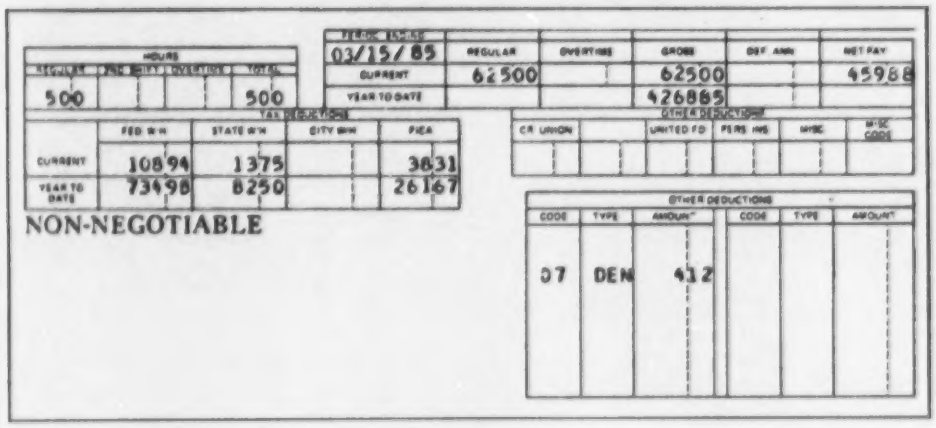
Document Tasks

Material/Structure: Table **Process/Strategy: Locate**

Here is a wage and tax statement that comes with a paycheck.

8. What is the current net pay? _____

9. What is the gross pay for this year to date? _____



HOURS				PERIOD ENDING	REGULAR	OVERTIME	GROSS	DEF. AMT.	NET PAY
REGULAR	PAID HOLIDAY	OVERTIME	TOTAL	03/15/85					
500			500	CURRENT	62500		62500		45988
				YEAR TO DATE			426885		

TAX DEDUCTIONS				
	FED W/H	STATE W/H	CITY W/H	FICA
CURRENT	10894	1375		3831
YEAR TO DATE	73498	8250		26167

OTHER DEDUCTIONS					
CR. UNION		UNITED FD	PERS INS	MISC	MISC CODE

OTHER DEDUCTIONS					
CODE	TYPE	AMOUNT	CODE	TYPE	AMOUNT
07	DEN	412			

NON-NEGOTIABLE

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Scoring guide for wage and tax statement

8. *1: 459.88.

2: Any other amount.

9: I don't know.

0: No response (blank)

9. *1: 4268.85.

2: Any other amount.

9: I don't know.

0: No response (blank)

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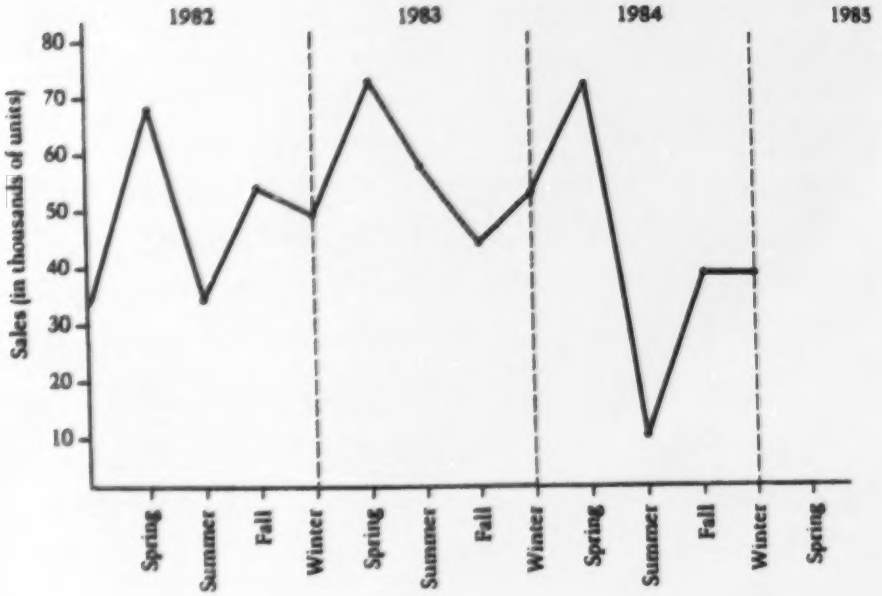
Document Tasks

Material/Structure: Graph **Process/Strategy: Integrate**

13. You are a marketing manager for a small manufacturing firm. This graph shows your company's sales over the last three years. Given the seasonal pattern shown on the graph, predict the sales for Spring 1985 (in thousands) by putting an "x" on the graph.



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Scoring guide for sales graph

13. *1: Puts an "x" or other mark on the graph at any point above the point for Winter, 1984, in the area under 1985.

2: Puts an "x" on the graph at any point at or under the point for Winter, 1984, in the area under 1985 or puts an "x" anywhere under one of the other years.

9: I don't know.

0: No response (blank)

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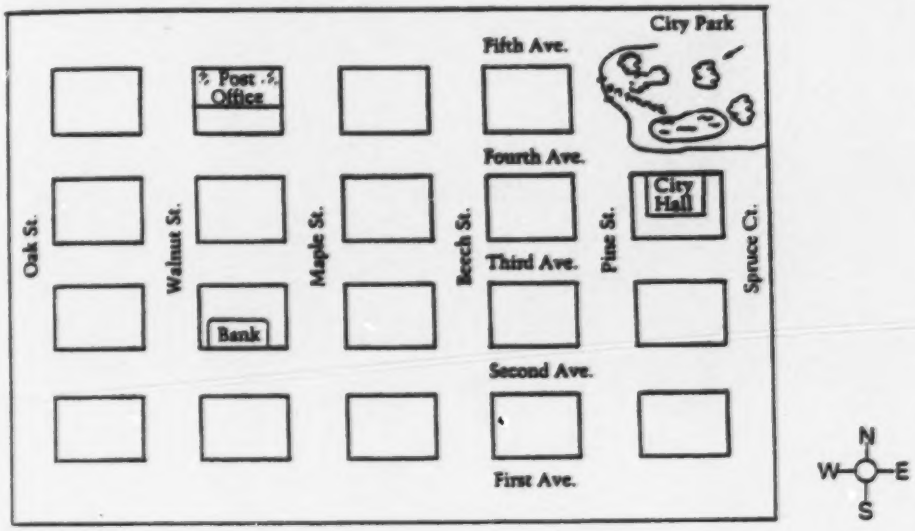
Document Tasks

Material/Structure: Map **Process/Strategy: Cycle**

6. Use this map to follow directions.

Begin at the Fourth Avenue side of City Hall.
Go west to Beech Street.
Go north 1 block.
Go west 2 blocks.
You are now at the corner of _____ and _____.



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Scoring guide for map

6. *1: Fifth (Avenue) and Walnut (Street). Accept mark on map at correct point.

2: Any other answer.

9: I don't know.

0: No response (blank)

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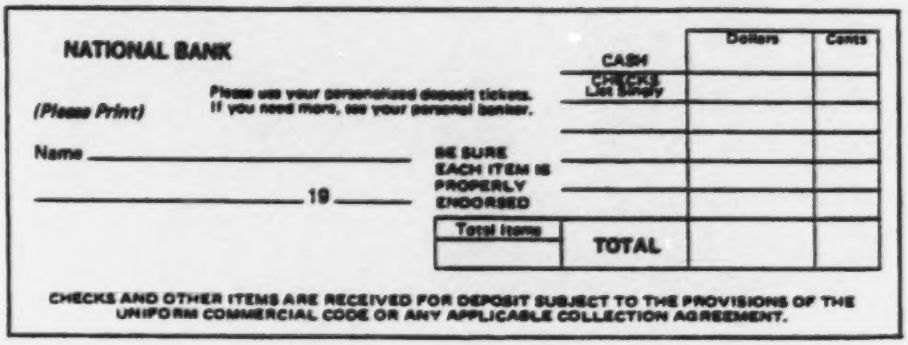
Quantitative Tasks

Material/Structure: Form **Process/Strategy: Addition**

8. You wish to deposit a $300 check and $57.23 in cash in a checking account. Fill out your deposit slip to do so. List both deposits and indicate the total amount deposited. Date your deposit slip May 22, 1985.


NATIONAL BANK
(Please Print)
Please use your personalized deposit tickets. If you need more, see your personal banker.
Name
19
BE SURE EACH ITEM IS PROPERLY ENDORSED
CASH
CHECKS List Singly
Total Items
TOTAL
Dollars
Cents
CHECKS AND OTHER ITEMS ARE RECEIVED FOR DEPOSIT SUBJECT TO THE PROVISIONS OF THE UNIFORM COMMERCIAL CODE OR ANY APPLICABLE COLLECTION AGREEMENT.

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Scoring guide for deposit slip

Total

*1: 357.23 or when enters incorrect amounts for "cash" and/or "checks," adds them correctly.

2: Any other amount. Or fails to fill in, when other parts are attempted.

0: No response: form totally blank.

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Quantitative Tasks

Material/Structure: Table

Process/Strategy: #4, Combination
#5, Multiplication

Suppose you had $3.00 to spend for lunch.

4. If you order a Lancaster Special sandwich and onion soup, how much change would you get back? _____

5. How much should you leave for a 10% tip? _____

Soups — Made by our Chef Daily

Onion soup	60
Soup of the day	60
Vichyssoise in Summer	
Beef-burgers, broiled to order, ¼ lb. of the finest Beef available, seasoned to perfection and served on a buttered bun	1.85
Wine Cheddar-cheese burger	1.95
Blue-cheese burger	1.95
Pineapple burger	1.95
Bacon burger	2.10
Wine Cheddar-cheese & Bacon burger	2.25

Sandwiches

Sliced Turkey — Garnished	1.30
Turkey Salad — Garnished	95
Chicken Salad — Garnished	95
Tuna Fish Salad — Garnished	95
Sliced Beef Tongue — Garnished	1.50
Grilled Wine Cheddar-Cheese	75
The Lancaster Special	1.95
Corned Beef, Melted Swiss Cheese, Sauerkraut on Seeded Rye . . . Need we say more?	

Minimum Check at Lunch 1.00

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Scoring guide for lunch menu

4. *1: 45¢.

2: Any other amount or indicates two amounts even if one is correct.

9: I don't know.

0: No response (blank)

5. *1: 25¢ or 26¢.

2: Any other amount or indicates two amounts even if one is correct.

9: I don't know.

0: No response (blank)

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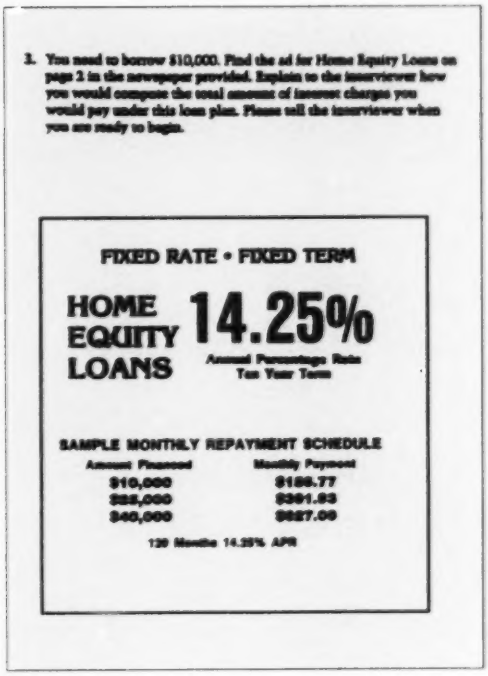
Quantitative Tasks

Material/Structure: Miscellaneous **Process/Strategy: Combination**



3. You need to borrow $10,000. Find the ad for Home Equity Loans on page 2 in the newspaper provided. Explain to the interviewer how you would compute the total amount of interest charges you would pay under this loan plan. Please tell the interviewer when you are ready to begin.

FIXED RATE • FIXED TERM

HOME EQUITY LOANS 14.25%

Annual Percentage Rate
Ten Year Term

SAMPLE MONTHLY REPAYMENT SCHEDULE

Amount Financed	Monthly Payment
$10,000	$156.77
$25,000	$391.93
$40,000	$627.09

120 Months 14.25% APR

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Scoring guide for home equity loan

3. *3: Speaker explains the two basic steps in computing the total interest charges, i.e., the monthly payment ($156.77) times the number of payments (120) equals the total loan payment; the total loan payment minus the amount of the loan ($10,000) equals the total interest charges.

2: The speaker explains one but not both steps in computing the total interest charges or is vague about the steps, e.g., you need to know how much you will pay over 10 years.

1: The speaker states something other than an explanation of computing interest charges, or gives an incorrect explanation, e.g., the loan ($10,000) times the interest rate (14.25%) equals the total interest charges.

0: No response; nothing on tape; no notes by interviewer, or interviewer writes in the interview guide to the effect, "Respondent can't answer question."

9: I don't know, can't do; refusal.

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